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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/911,763

07/23/2001

Farid Askary

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05/05/2004

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EXAMINER

COUSO, YON JUNG

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 05/05/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/911,763

Applicant(s)

ASKARY, FARID

Examiner

Yon Couso

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-22 is/are allowed.
- 6) ☒ Claim(s) 23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>3</u> . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____. |

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1. Claim 23 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for subject matters in claims 1 and 22, does not reasonably provide enablement for "a method for measuring pitch in data obtained from metrology and imaging systems, the method comprising: obtaining a data set from an imaging or metrology instrument; converting the data set into digital format if not already in that format; dividing the digitized data set into one or more data subsets, each data subset being denoted by a scalar function $f(\cdot)$, wherein \cdot represents a vector; constructing a criteria function $g(\cdot)$ from each scalar function $f(\cdot)$ and its translation denote by $f(+)$, wherein $+$ represents the translation vector whose individual components are varied over a corresponding range; determining a value of translation vector for each criteria function $g(\cdot)$ such that the magnitude of the corresponding $g(\cdot)$ would be either a maximum or a minimum whichever appropriate at said value, wherein said value is not zero; and reporting a vector whose components are mathematical functions of the corresponding values for said criteria functions as a vector representation of the pitch in the data set." The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The specification fails to disclose measuring pitch in data by using scalar function $f(x)$, wherein x represents a vector. Only place in the specification remotely close to what is claimed is at page 1, line 30-page 2, line 3. While it mentions vector in this part of description, it is mainly directed to function f can be a vector itself having several components. There is nothing in the specification teaches "scalar

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function $f(x)$, wherein x represents a vector", not to mention how this function is used in the steps to measure the pitch in data obtained from metrology instrument.

2. Claims 1-22 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Prior art fails to teach or disclose a method for measuring pitch in data obtained from metrology and imaging systems, the method comprising obtaining a data set from a metrology or an imaging instrument, converting the data set into digital format if not already in that format, mapping the digitized data set into a one-dimensional profile data if the digitized data set is not already one-dimensional, the one-dimensional profile data being denoted by $f(x)$ being a function of x position values corresponding to equally spaced or nearly equally spaced pixels; constructing a criteria function $g(T)$ as a one-dimensional data array from the profile data $f(x)$ or any of its derivatives and a translation of the profile data $f(x)$ denote by $f(x+T)$ or any of its derivatives, wherein T represents the amount of translation, and $g(T)$ being a function of T translation values corresponding to equally spaced or nearly equally spaced pixels, determining a value of translation T either as a whole pixel or with subpixel interpolation such that the magnitude of $g(T)$ would be either a maximum or a minimum whichever appropriate at said value, wherein said value is not zero, and reporting said value as the pitch in the data set.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sicignano et al is cited because the reference teaches analyzing the pitch between the features in each line using the pitches of all determined lines.

Otake et al is cited because the reference teaches measuring pitch length by averaging a plurality of pitch length measurement results.

Yee et al is cited because the reference teaches calibration of a scanning electron microscope using critical dimension of wafer including pitch.

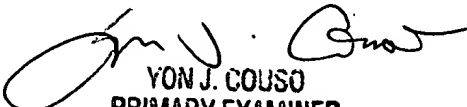
Singh et al is cited because the reference teaches multi-pitch and line calibration for mask and wafer CD-SEM system.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yon Couso whose telephone number is (703) 305-4779. The examiner can normally be reached on 8:30 am –5:00 pm from Monday to Friday

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3800.

Yjc
April 30, 2004


YON J. COUSO
PRIMARY EXAMINER